

Space Suit Joint Torque Testing

In 2009 and early 2010, a test was performed to quantify the torque required to manipulate joints in several existing operational and prototype space suits in an effort to develop joint torque requirements appropriate for a new Constellation Program space suit system. The same test method was levied on the Constellation space suit contractors to verify that their suit design meets the requirements. However, because the original test was set up and conducted by a single test operator there was some question as to whether this method was repeatable enough to be considered a standard verification method for Constellation or other future space suits. In order to validate the method itself, a representative subset of the previous test was repeated, using the same information that would be available to space suit contractors, but set up and conducted by someone not familiar with the previous test. The resultant data was compared using graphical and statistical analysis and a variance in torque values for some of the tested joints was apparent. Potential variables that could have affected the data were identified and re-testing was conducted in an attempt to eliminate these variables. The results of the retest will be used to determine if further testing and modification is necessary before the method can be validated.